

## WE CLAIM:

1. A fire resistant stable electrolyte composition for lithium-ion based electrochemical devices which comprises:

LiBF<sub>4</sub> salt in the range of 1.5 to 3.0 molar concentration in the mixture of ethylene carbonate in the range of 70 to 90% by weight percentage, and gamma-butyrolactone in the range of 10 to 30% by weight percentage.

2. A fire resistant stable electrolyte composition for lithium-ion based electrochemical devices which comprises:

LiBF<sub>4</sub> salt in the range of 1.5 to 3.0 molar concentration in the mixture of ethylene carbonate in the range of 70 to 90% by weight percentage, and propylene carbonate in the range of 10 to 30% by weight percentage.

3. A fire resistant stable electrolyte composition for lithium-ion based electrochemical devices which comprises:

LiBF<sub>4</sub> salt in the range of 1.5 to 3 molar concentration in the mixture of ethylene carbonate in the range of 70 to 90% by weight percentage, and butylene carbonate in the range of 10 to 30% by weight percentage.

4. A fire resistant stable electrolyte composition for lithium-ion based electrochemical devices which comprises:

two molar LiBF<sub>4</sub> salt concentration in the mixture of ethylene carbonate of 80% by weight percentage, and gamma-butyrolactone of 20% by weight percentage.

5. A fire resistant stable electrolyte composition for lithium-ion based

electrochemical devices which comprises:

1.5 molar  $\text{LiBF}_4$  salt concentration in the mixture of  
ethylene carbonate of 80% by weight percentage, and  
propylene carbonate of 20% by weight percentage.

- 5 6. A fire resistant stable electrolyte composition for lithium-ion batteries  
and other lithium based electrochemical devices which comprises:

1.5 molar  $\text{LiBF}_4$  salt concentration in the mixture of  
ethylene carbonate of 80% by weight percentage, and  
butylene carbonate of 20% by weight percentage.

- 10 7. A fire resistant stable electrolyte composition for lithium-ion based  
electrochemical devices which comprises a mixture of electrolytes as described in claims  
1, 2 and 3.

8. A fire resistant stable electrolyte composition for lithium-ion based  
electrochemical devices which comprises a mixture of electrolytes as described in  
15 claims 4, 5 and 6,

9. A fire resistant stable electrolyte composition as described in claims 1 to 8  
inclusive for lithium-ion based electrochemical devices in which said  $\text{LiBF}_4$  salt is  
replaced by;

at least one other lithium salt in the range of 1.0 to 2.0 molar concentration.

- 20 10. A fire resistant stable electrolyte composition for lithium-ion based  
electrochemical devices which comprises:

$\text{LiBF}_4$  salt in the range of 1.5 to 3.0 molar concentration in approximately 100%  
ethylene carbonate.

11. A fire resistant stable electrolyte composition as described in claims 1-8 inclusive to which said  $\text{LiBF}_4$  salt has at least one other lithium salt added thereto in the range of 0.5 M to 1.5 M.

12. A fire resistant stable electrolyte as described in claims 1-11 inclusive, in

5 combination with lithium-ion based based electrochemical devices, which have a cathode with a lithium compound additive.